

WE CLAIM:

1. A modified synthetic nucleic acid molecule wherein said modification enhances the stability of the nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 3' splice region comprising a branch point, a pyrimidine tract and a 3' splice acceptor site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

2. A modified synthetic nucleic acid molecule wherein said modification enhances the stability of the nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 3' splice acceptor site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

3. A modified synthetic nucleic acid molecule wherein said modification enhances the stability of the nucleic acid molecule comprising :
- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
 - b) a 5' splice site; and
 - c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

4. The modified synthetic nucleic acid molecule of claim 1 wherein the nucleic acid molecule further comprises a 5' donor site.

5. The modified synthetic nucleic molecule of claim 1, 2, 3 or 4 further comprising a spacer region that separates the 3' splice region from the target binding domain.

6. The modified synthetic nucleic acid molecule of claim 1, 2, 3, or 4 further comprising a safety sequence comprising one or more complementary sequences that bind to one or both sides of the 3' splice site.

7. The modified synthetic nucleic acid molecule of claim 1, 2, 3, or 4 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

8. The modified synthetic nucleic acid molecule of claim 5 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

9. The modified synthetic nucleic acid molecule of claim 6 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

10. The modified synthetic nucleic acid molecule of claim 1, 2, 3 or 4 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

11. The modified synthetic nucleic acid molecule of claim 5 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

12. The nucleic acid molecule of claim 6 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

13. The modified synthetic nucleic acid molecule of claim 1, 2, 3 or 4 wherein the nucleotide sequence to be *trans*-spliced to the target pre-mRNA contains a nonsense mutation.

14. The modified synthetic nucleic acid molecule of claim 5 wherein the nucleotide sequence to be *trans*-spliced to the target pre-mRNA contains a nonsense mutation.

15. The modified synthetic nucleic acid molecule of claim 6 wherein the nucleotide sequence to be *trans*-spliced to the target pre-mRNA contains a nonsense mutation.

16. A modified synthetic nucleic acid molecule wherein said modification enhances the stability of the nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 3' splice region comprising a branch point, a pyrimidine tract and a 3' splice acceptor site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

17. A modified synthetic nucleic acid molecule wherein said modification enhances the stability of the nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 3' splice acceptor site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

18. A modified synthetic nucleic acid molecule wherein said modification enhances the stability of the nucleic acid molecule comprising :

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 5' splice site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

19. The modified synthetic nucleic acid molecule of claim 16 wherein the nucleic acid molecule further comprises a 5' donor site.

20. The modified synthetic nucleic molecule of claim 16, 17, 18 or 19 further comprising a spacer region that separates the 3' splice region from the target binding domain.

21. The modified synthetic nucleic acid molecule of claim 16, 17, 18 or 19 further comprising a safety sequence comprising one or more complementary sequences that bind to one or both sides of the 3' splice site.

22. The modified synthetic nucleic acid molecule of claim 16, 17, 18 or 19 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

23. The modified synthetic nucleic acid molecule of claim 20 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

24. The modified synthetic nucleic acid molecule of claim 21 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

25. The modified synthetic nucleic acid molecule of claim 16, 17, 18 or 19 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

26. The modified synthetic nucleic acid molecule of claim 20 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

27. The nucleic acid molecule of claim 21 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

28. The modified synthetic nucleic acid molecule of claim 16, 17, 18 or 19

wherein the nucleotide sequence to be *trans*-spliced to the target pre-mRNA contains a nonsense mutation.

29. The modified synthetic nucleic acid molecule of claim 20 wherein the

nucleotide sequence to be *trans*-spliced to the target pre-mRNA contains a nonsense mutation.

30. The modified synthetic nucleic acid molecule of claim 21 wherein the

nucleotide sequence to be *trans*-spliced to the target pre-mRNA contains a nonsense mutation.

31. The nucleic acid molecule of claim 1, 2, 3, 4, 5, 6, 16, 17, 18, 19, 20 or 21

further comprising a nuclear localization signal.

32. The nucleic acid molecule of claim 1, 2, 3, 4, 5, 6, 16, 17, 18, 19, 20 or 21

wherein said nucleic acid molecule is a circular molecule.

33. The nucleic acid molecule of claim 1, 2, 3, 4, 5, 6, 16, 17, 18, 19, 20 or 21

further comprising an enhancer sequence.

34. A composition comprising a physiological acceptable carrier and a nucleic

acid molecule according to claim 1, 2, 3, 4, 5, 6, 16, 17, 18, 19, 20 or 21.

35. A composition comprising a physiological acceptable carrier and a nucleic acid molecule according to claim 1, 2, 3, 4, 5, 6, 16, 17, 18, 19, 20 or 21.

36. An expression vector comprising an RNA polymerase promoter and a nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 3' splice region comprising a branch point, a pyrimidine tract and a 3' splice acceptor site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

37. An expression vector comprising an RNA polymerase promoter and a nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 3' splice acceptor site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

38. An expression vector comprising an RNA polymerase promoter and a nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within the cell;
- b) a 5' splice site; and
- c) a nucleotide sequence to be *trans*-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

39. The expression vector of claim 36 wherein the nucleic acid molecule further comprises a 5' donor site.

40. The expression vector of claim 36, 37, 38 or 39 further comprising a spacer region that separates the 3' splice region from the target binding domain.

41. The expression vector of claim 36, 37, 38 or 39 further comprising a safety sequence comprising one or more complementary sequences that bind to one or both sides of the 3' splice site.

42. The expression vector of claim 36, 37, 38 or 39 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

43. The expression vector of claim 40 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

44. The expression vector of claim 41 wherein the binding of the nucleic acid molecule to the target pre-mRNA is mediated by complementary, triple helix formation, or protein-nucleic acid interaction.

45. The expression vector of claim 36, 37, 38 or 39 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

46. The expression vector of claim 40 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

47. The expression vector of claim 41 wherein the nucleotide to be *trans*-spliced to the target pre-mRNA encodes a translatable polypeptide.

48. A method for synthesizing the nucleic acid molecule of claim 1, 2, 3, 4, 5 or 6 wherein said nucleic acid molecule is chemically synthesized.

49. A method for synthesizing the nucleic acid molecule of claim 1, 2, 3, 4, or 5 wherein said nucleic acid molecule is synthesized *in vitro*.

50. A modified synthetic nucleic acid molecule wherein said modification enhances the stability of the nucleic acid molecule comprising:

- a) one or more target binding domains that target binding of the nucleic acid molecule to a pre-mRNA expressed within a cell;
- b) a 5' donor site;
- c) a 3' splice acceptor site;
- d) a nucleotide sequence to be trans-spliced to the target pre-mRNA;

wherein said nucleic acid molecule is recognized by nuclear splicing components within the cell.

51. The modified synthetic nucleic acid molecule of claim 50 further comprising a spacer region that separates the 3' splice region from the target binding domain.

52. The modified synthetic nucleic acid molecule of claim 50 further comprising a safety sequence comprising one or more complementary sequences that bind one or both sides of the 3' splice site.

53. The nucleic acid molecule according to claim 1, 2, 3, 4, 5, 6, 16, 17, 18, 19, 20 or 21 associated with a liposome.